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EXAMINER
HAN, CLEMENCE S

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 March 2009</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-25 and 29-37* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-25 and 29-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 22 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim recites "A computer program embodied in a machine-readable medium" in line 1. The specification discloses carrier wave traveling over a medium such as airwaves (page 20 lines 1-19).

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claim 1, 3-25, 29 and 31-37 rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al. (US Pub. 2003/0076849) in view of Matsuo et al. (US Pub. 2003/0227925) and further in view of Viswanathan (US Pub. 2004/0208197).

Regarding claim 1, 11, 22 and 23, Morgan teaches a method of allocating queues in a network device, the method comprising: receiving a packet at an ingress port of the network device [0006], [0008], making a classification for an incoming packet [0027], the classification comprising at least one of an egress port number or an ingress port

number [0032]; determining whether a previously-allocated queue exists for the

classification [0049]; allocating, at the ingress port, a queue for the classification if it is

determined that no previously-allocated queue exists for the classification [0011]; and

scheduling the packet for transmission between the ingress port and one of a plurality of

egress ports of the network device [0037]. Morgan, however, does not teach explicitly

searching a memory of allocated physical queues/a content addressable memory. Matsuo

teaches searching a memory of allocated physical queues/a content addressable memory

20 [0162]. It would have been obvious to one skilled in the art to modify Morgan to use

CAM as taught by Matsuo in order to enable high speed search [0049]. Morgan in view

of Matsu, however, does not teach storing control information relating to the packet in the

allocated queue and saving packet payload information in a different location from that of

the allocated queue. Viswanathan teaches storing control information (header) relating to

the packet in the allocated queue 115 and saving packet payload information in a

different location 105 from that of the allocated queue [0035], [0048]. It would have

been obvious to one skilled in the art to modify Morgan in view of Matsu to store control

information relating to the packet in the allocated queue and save packet payload

information in a different location from that of the allocated queue as taught by

Viswanathan in order to maintain header information for further processing [0036].

    Regarding claim 3 and 13, Morgan teaches the queue is a virtual output queue

[0053].

Regarding claim 4 and 14, Morgan teaches detecting when a previously-allocated

queue is empty; and de-allocating the empty previously-allocated queue [0043], [0053].

Regarding claim 5 and 15, Morgan teaches the queue is associated with an ingress

port [0008].

Regarding claim 6 and 16, Morgan teaches the classification is based on a packet

source, a packet destination or a packet priority [0062].

Regarding claim 7 and 17, Morgan teaches the classification comprises a priority

number [0051].

Regarding claim 8 and 18, Matsuo teaches the determining step comprises

addressing the memory of allocated physical queues in a single cycle [0162] (Matsuo

teaches using CAM and its contents can be searched in one cycle, see instant

specification page 16 line 16-17).

Regarding claim 9 and 19, Morgan teaches updating a memory when a queue is

de-allocated, wherein the memory indicates whether the classification corresponds to the

previously-allocated queue [0034].

Regarding claim 10, 20 and 21, Morgan teaches the network device further

comprises a free list that indicates queues available for allocation and wherein the method

further comprises updating the free list when the previously-allocated queue is de-

allocated [0053].

Regarding claim 12, Morgan teaches the queue is associated with an ingress port

of the network device [0008], [0032].

Regarding claim 24, Matsuo teaches the memory is the content addressable

memory is searchable in one clock cycle [0162] (Matsuo teaches using CAM and its

contents can be searched in one cycle, see instant specification page 16 line 16-17).

Regarding claim 25, Morgan teaches the memory is a random access memory

[0034].

Regarding claim 29, Morgan teaches determining a first number of packets that an

ingress port of the network device can receive [0040], [0041]; and allocating a second

number of physical queues for the ingress port, wherein the second number is less than or

equal to the first number [0044]-[0046].

Regarding claim 31, Morgan teaches identifying a category for each packet

arriving at the ingress port; correlating the category to an existing physical queue; and

storing packet information in the existing physical queue [0018].

Regarding claim 32, Morgan teaches identifying a category for each packet

arriving at the ingress port; and assigning the category to a physical queue, wherein the

network device allocates a new physical queue only when there is no existing physical

queue for the category [0043], [0044].

Regarding claim 33, Morgan teaches the packet information comprises control

information selected from a list consisting of destination information, source information,

priority information, payload type information and payload size information [0062].

Regarding claim 34, Morgan teaches an apparatus, comprising: a plurality of ports,

comprising at least one ingress port and at least one egress port (Figure 1); a

classification engine for making a classification for an incoming packet from an ingress

port [0027], the classification comprising at least one of an egress port number or an

ingress port number [0032]; a memory system 124; and a processor configured to do the

following: determine whether a previously-allocated queue exists for the classification

[0049]; allocate, at an ingress port of the plurality of ingress ports, a queue for the

classification if no previously-allocated queue exists for the classification [0011]; and

schedule the packet for transmission between the ingress port and one of the plurality of

egress ports of the network device [0037]. Morgan, however, does not teach explicitly

determining with reference to a first memory of the memory system. Matsuo teaches

determining with reference to a first memory 20 of the memory system [0162]. It would

have been obvious to one skilled in the art to modify Morgan to determine with reference

to a first memory as taught by Matsuo in order to enable high speed search [0049].

Morgan in view of Matsu, however, does not teach store control information relating to

the packet in a second memory location of the memory system that corresponds to the

allocated queue and save other packet information in a third memory location of the

memory system. Viswanathan teaches store control information (header) relating to the

packet in a second memory location 115 of the memory system that corresponds to the

allocated queue and save other packet information (payload) in a third memory location

105 of the memory system [0035], [0048]. It would have been obvious to one skilled in

the art to modify Morgan in view of Matsu to store control information relating to the

packet in a second memory location of the memory system that corresponds to the

allocated queue and save other packet information in a third memory location of the

memory system as taught by Viswanathan in order to maintain header information for

further processing [0036].

Regarding claim 35, Viswanathan teaches the other packet information comprises

payload information [0048].

Regarding claim 36, Viswanathan teaches the second memory location 115

comprises a buffer of a microprocessor.

Regarding claim 37, Viswanathan teaches the third memory location 105 is in a

device other than the microprocessor.

4.   Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et

al. in view of Matsuo et al. and Viswanathan as applied to claim 29 above, and further in

view of Jenne et al. (US Pub. 2003/0126223).

Regarding claim 30, Morgan teaches determining a first number of packets that an

ingress port of the network device can receive [0040], [0041]; and allocating a second

number of physical queues for the ingress port, wherein the second number is less than or

equal to the first number [0044]-[0046]. Morgan in view of Matsuo and Viswanathan,

however, does not teach the network device operates according to a Fibre Channel

protocol and wherein the determining step is based on a number of buffer-to-buffer

credits granted by the ingress port. Jenne teaches the network device operates according

to a Fibre Channel protocol [0018] and wherein the determining step is based on a

number of buffer-to-buffer credits granted by the ingress port [0006]. It would have been

obvious to one skilled in the art to modify Morgan in view of Matsuo and Viswanathan to be with the network device operates according to a Fibre Channel protocol [0018] and wherein the determining step is based on a number of buffer-to-buffer credits granted by the ingress port as taught by Jenne in order to provide end-to-end congestion control [0003].

Response to Arguments

5.   Applicant's arguments with respect to claim 1, 3-25 and 29-37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ricky Ngo/   /C. H./
Supervisory Patent Examiner, Art Unit 2416   Examiner, Art Unit 2416